

The URETHROSCOPE as an AID in the DIAGNOSIS
and TREATMENT of GONORRHOEA
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1. Introduction :

It is now universally acknowledged that no Venereal Diseases Clinic can be considered adequately equipped unless in possession of a modern urethroscope.

The contention that all cases of urethritis can be cured without the aid of this instrument must be refuted. In many cases certainly, success in treatment can be achieved without its use, but in a very wide margin of cases urethroscopic examination is necessary to establish a complete and permanent cure.

One is constantly seeing examples of so-called "relapse cases" where the treatment of the original infection has been restricted to irrigations, sometimes with prostatic massage and vaccines, without, however, a urethroscopic examination prior to their being discharged as cured.

Had urethroscopy been undertaken these relapses need never have occurred, for the condition responsible for /

for the relapse would have been discovered and with suitable treatment cured. This is the experience of all who have made a careful study of the modern treatment of Gonorrhoea. It stands to reason that by inspecting the urethra directly through the urethroscope the surgeon will acquire a much more intimate and detailed knowledge of its condition than he can ever hope to gain by any other means.

In a very interesting contribution to the literature on the subject, Hughes points out that in the Naval Barracks at Portsmouth in 1917-18 "after the introduction of the urethroscope the incidence of gonorrhoea cases fell between 40% and 45%, and this fall was entirely due to the disappearance of 'relapse cases'".

Doubtless the instrument would be more generally employed were it not for the fact that it is a difficult one to master.

The advance of the urethroscope from the crude to the present well-nigh perfected state has been a rapid one. The earliest type of urethroscope possessed none of the finer points in construction found in modern instruments, but consisted merely of a tube illuminated by a light situated externally. The view of the urethra obtained by such an instrument was /

was naturally very imperfect, and on that account these early instruments had a limited application.

At the present time the urethroscope is as essential to the urologist in the diagnosis and treatment of gonorrhoea as the stethoscope is to the physician in cases of disease of the chest.

Many outstanding additions and improvements have been added to the urethroscope in recent times notably in the following particulars :

- (1) The source and position of the light.
- (2) The magnification of the image by means of lenses.
- (3) The provision of a means of distending the walls
of the urethra, and
- (4) The provision of a means of undertaking operative
work through the urethroscope.

2. Varieties of Modern Instruments :

Many patterns of urethroscope are now available to the surgeon, but they may be divided primarily into two groups, one for examination of the anterior and the other for examination of the posterior urethra.

Anterior urethroscopes are by far the more commonly employed and of these the writer's preference lies with the Holborn and Cambell instruments in both of which an air-bellows is attached which permits of distension of the urethra while under observation.

(a) For routine examination of the anterior urethra an aero-urethroscope is much more satisfactory as it affords an extensive view and renders particularly easy the detection of infiltrates even in the early stages.

Air distension gives the required information as to whether any part of the canal is dilating properly or not. This is information of the most vital importance. In the second place it helps to determine whether the urethral follicles are infected or not.

Luy's urethroscope makes no provision for air distension, but experience has proved that it is particularly useful in cases requiring operative procedure especially the removal of polypi by the curette or electro-cautery.

The /

The advantage of Luy's instrument lies in the fact that after a polypus has been manoeuvred into a suitable position for curetting, the magnifying eye-piece can be easily turned to the side or removed to allow of the introduction of the curette without in any way disturbing the position of the polypus in the field.

In aero-urethrosopes the eye-piece is firmly attached to the tube and its removal is such a clumsy procedure that almost invariably the field is moved and the polypus slips out of view.

Until recently it has been a matter of great difficulty in operative work in the anterior urethra under air distension, to keep up air pressure while the instrument is in use. Mr Wyndham Powell some time ago suggested a solution of this problem. In his own words his scheme has been - "to affix to the distal end of the urethroscopic tube a short instrument by means of which a small operation can be performed exactly under the same conditions as apply to an ordinary urethroscopic examination. The urethroscope acts as the handle and the cannula itself as the shaft of the instrument". This method is useful when using the knife or curette doubtless, but is of no assistance in cases where air-distension is required to aid the passage of a filiform through a tight stricture. /

stricture.

A new urethroscope by Swift Joly has just recently been put on the market, and is provided with an attachment specially designed to maintain air-distension during the introduction of small size bougies. When a bougie has been passed through a special opening in the instrument, it is clasped by a rubber band which effectively prevents the escape of air during distension of the urethra, and by means of a small screw it is possible to tighten the elastic band if required. The instrument affords an excellent view of the field and should be of great service in the treatment of cases of stricture showing marked contracture.

(b) With regard to the illumination of the urethra, this may be either extrinsic or intrinsic.

In the former the lamp and head-mirror or light lies outside the sheath; in the latter the lamp is always within the sheath, the illumination being produced by a long-stemmed lamp with its bulb close to the end of the tube. The Cambell, Luys and Holborn instruments are all examples of intrinsic illumination urethroscopes. In the Wyndham Powell instrument extrinsic illumination is employed.

The advantages of illumination by the intrinsic method / .

method far outweigh the disadvantages, which are :

- (1) The lamp and stem occupy part of the lumen and consequently there is
- (2) a restricted field.

In actual practice one finds this to be of little moment, quite a satisfactory view of the field being obtained.

The advantages are :

- (1) Excellent illumination owing to the lamp being close to the object viewed.
- (2) Clear definition of the field.

(c) The addition of a magnifying eye-piece in modern instruments is a great advance, as it allows of a much more accurate and detailed view of the field especially the openings of follicles and lacunae. To be able to make a careful inspection of the gland openings is highly important as the disease may be restricted to one or two glands and if not detected be responsible for an acute relapse later.

(d) The opening at the end of the urethroscopic tube varies in different models. It may be cut at right angles to the axis of the sheath or cut obliquely. In the latter type the field is larger and /

and a rather better view is obtained.

(e) Posterior Urethroscopy is seldom required and only then in exceptional cases, as nearly all cases of posterior urethritis can be cured without its use. The reason for this is that the numerous prostatic tubules opening into the posterior urethra can be cleared of infection by massage of the prostate. If this is properly carried out there is little likelihood of any trouble arising in that part of the urethra.

Occasionally, however, as in a case of recurrent epididymitis, it becomes necessary to examine the posterior urethra. A satisfactory view can be obtained with the irrigating urethroscope of Wossidlo or with Buerger's cysto-urethroscope.

The view of the field is, of course, indirect and considerable experience is required before these instruments can be used with any degree of confidence.

3. Uses of the Urethroscope :

Briefly stated the urethroscope is of value to the urologist in two ways, viz :

- (a) Diagnosis.
- (b) Treatment.

(a) The diagnosis of gonorrhoea in the acute stages is not as a rule a matter of much difficulty, but the position is quite the reverse when the acute manifestations have passed off.

It frequently happens that a patient will report for the first time some weeks after infection. He may have had no treatment whatever, or, as is frequently the case, has treated himself with Sandalwood Oil Capsules or irrigated with Condy's Fluid. The only complaint is a "gleet" in the morning. On examination by the multiple glass test the urines are found to be clear, but the first contains some mucopurulent "threads." Urethroscope examination shows that the infection is persisting in one or more of the follicles. In such a case the urethroscope makes it possible to diagnose and localise existing disease.

In addition it is also of great value in detecting lesions resulting from an old-standing gonococcal process, e.g., the various states of stricture. The method /

method of diagnosing stricture by means of a bougie is antiquated. There is no point in trusting to the sense of touch when one can employ the sense of sight, especially as stricture is so frequently simulated by spasm. The association of stricture and spasm is more common than is generally supposed, and it is most certainly impossible to differentiate between these two conditions by means of a bougie.

Apart from the common manifestations and sequelae of gonorrhoea, urethroscopy enables a diagnosis to be made of the rarer conditions occasionally met with; for example, polypi and congenital abnormalities such as diverticula.

(b) The success of the modern treatment of gonorrhoea is undoubtedly due in large measure to the urethroscope. The refinements in diagnosis which are now possible by its use have put the treatment of the disease and its complications on a rational basis. By accurate diagnosis the instrument not only suggests the appropriate treatment required, but enables the surgeon to gauge the amount of treatment indicated in each case.

If, for example, a case shows evidence of early infiltration of the urethral mucosa, it will require instrumental /

instrumental treatment, preferably by Kollmann's dilator. This may be done on three occasions at intervals of about 5 days. At the end of that time the next step is to examine the urethra once more by the urethroscope. If the infiltration has disappeared there is no indication for further treatment. If still present it will be possible to judge from the degree of improvement the amount of further treatment necessary.

In addition the urethroscope is a very efficient guide as to the relative values of various forms of therapy. In this connection as far as the treatment of early infiltrates is concerned, I am convinced that the best and most efficacious remedy is Kollmann's irrigating dilator. This is a conclusion I arrived at after careful urethroscopic observation of a large number of cases treated by different methods.

4. Indications :

A careful urethroscopic examination is necessary in every case of gonorrhoea, but it is essential to wait until all acute manifestations of the disease have subsided before this operation is undertaken. Tender points along the urethra or complications such as prostatitis or epidymitis in their acute or sub-acute forms are definite contra-indications.

In general it may be said that urethroscopy is indicated in the chronic forms of urethritis, but in every case, prior to the use of the instrument, several points require investigation.

(a) A careful examination of the urine by the multiple-glass test is an essential preliminary. The purpose of this test is to ascertain the presence or absence of acute inflammation and if present its degree and site. As a general rule it is not wise to use the urethroscope in any given case until the urine is clear. The urine in the first glass may contain "threads" but if otherwise clear this need not be regarded as a contra-indication.

(b) Another point of importance is the presence or absence of the gonococcus. It is essential that the causal organism should be absent, or exist only in an attenuated form before any exploration of the urethra /

urethra is made.

It is always wise in cases where there is a history of frequent relapses to postpone the examination, as in such cases active or easily excited foci are present which urethroscopy would tend to provoke.

To use the urethroscope at random without a proper examination of each case does more harm than good and merely brings the instrument into disrepute.

The importance of waiting until all the acute stages of the disease have passed off lies in the fact that the instrument when introduced even with the greatest care necessarily causes a certain amount of irritation. Normally the mucous membrane of the urethra is extremely sensitive, but after an acute infection is much more so. An acute relapse therefore is a not uncommon sequel to urethroscopy in cases where the above points have been disregarded.

5. Contra-indications are as follows :

- (1) Acute stages or symptoms of the disease.
- (2) A history of frequent ^{acute} relapses.
- (3) Complications in their active or sub-acute forms.
- (4) Unfavourable reaction to a urethroscopic examination forbids another for a long time.
- (5) Anatomical defects, especially small meatus.

It will thus be evident that success in urethroscopy is not only dependent upon the skill of the operator in the manipulation of the instrument, but also upon a thorough examination of each patient prior to its use.

6. /

6. Preparation of the Patient :

An essential preliminary to urethroscopy is an examination of the meatus. While in the great bulk of cases there is no difficulty in passing at least a moderate sized urethroscopic tube, in a few cases the meatus requires to be enlarged. This difficulty of small meatus can as a rule be surmounted by dilating the opening with straight bougies. There is no need to pass these bougies completely, an inch or so is sufficient.

If this procedure should cause too much discomfort to the patient, the only alternative is to perform a meatotomy. This will entail postponing urethroscopy for a few days until the wound heals but there should then be no difficulty in passing a tube of considerable size. The larger the tube the more definite the diagnosis and the more satisfactory the treatment. My own practice is to employ the largest tube that can be passed without causing discomfort and without using force.

The patient should be instructed to retain his urine for at least two hours as urination washes away any discharge.

The immediate preparation of the patient includes removal of the clothing below the waist in order to expose /

expose the genital organs. He should then be instructed to lie flat on the operating table. A perforated square of mackintosh is placed over the genitals, leaving only the penis exposed. After the glans penis and meatus have been thoroughly cleansed with spirit the preparation of the patient is complete.

7. Introduction of the Urethroscope :

The introduction of the anterior urethroscope is a very simple procedure -

- (1) The patient is prepared as described and the operator stands at the patient's right side.
- (2) The penis is grasped with the left hand and the urethroscope, having been lubricated with boroglyceride or paraffin, is passed into the urethra.
- (3) Force should never be applied. On the contrary the instrument should be allowed to slide vertically into the canal by its own weight. This is a point, the importance of which cannot be over-emphasized. The collar formed by the junction of obturator and sheath is very liable to injure the mucosa and cause haemorrhage unless every care is taken.
- (4) When the sheath has been fully passed the obturator is withdrawn and the lubricant removed from the interior of the tube by sterile cotton-wool swabs.
- (5) The lamp is then introduced and the eye-piece fixed in position. It is best to use no more light than is necessary to give a satisfactory illumination of the field. Too powerful a light is dazzling to the eyes of the operator.
- (6) /

(6) The urethra can now be examined from the compressor urethrae muscle to the meatus. In such an examination attention will be directed to the lustre of the urethra; the condition of the follicles and lacunae; the presence or absence of infiltrates or new growths; and to the degree of elasticity of the walls as tested by air-distension.

The introduction of the posterior urethroscope is a rather more intricate proceeding. The patient is prepared as for anterior urethroscopy, but before introducing the instrument it is advisable to instil a little novocain into the deep urethra. As in passing the sound four manipulations are used.

(a) Gravitation is first and consists in allowing the instrument to slide vertically down to the bulb under its own weight.

(b) Elevation comprises supporting the beak of the instrument against the pubic arch so as to lift it out of the bulb. This is a step that can be assisted by the finger in the rectum.

(c) Depression consists in carrying the eye-piece downwards while the beak rotates under the arch of the pubis.

(d) /

(d) Penetration is the last step. For this the finger in the rectum should be passed to the apex of the prostate. The instrument is then slid along the finger to the neck of the bladder. A little gentle pressure against the vesicle sphincter carries the instrument into the bladder. If urine flows out on withdrawing the obturator the sheath should be withdrawn slightly. The light is then inserted and the eye-piece focussed. The use of an instrument which allows of irrigation and dilatation with water is an undoubted advantage, as exudate can be removed and the normal arrangement of the mucosa maintained.

8. The Use of Styptics and Anaesthetics :

Urethroscopy properly performed is a painless operation. Occasionally it gives rise to a slight feeling of discomfort but the examination should never cause actual physical suffering. Anaesthetics therefore play a very insignificant part in ordinary routine work, the only cases requiring local anaesthesia being those in which the patient is very nervous or the urethra hypersensitive.

In operative work anaesthesia is of great value; novocain in $\frac{1}{2}\%$ to 2% strength is very efficient.

In the case of narrow strictures where difficulty is experienced in passing a bougie, it is a good plan to instil novocain into the urethra as stricture and spasm are frequently associated and spasm relaxes under anaesthesia. In a few cases I have seen the so-called stricture disappear entirely and had no difficulty in passing large size bougies after the application of novocain.

It is in operative work also that styptics are of greatest value. Bleeding naturally obscures the field and adrenalin is extremely useful in controlling it. The styptic may be applied to a given point or in weaker solution flooded upon the surface of the field and then mopped away. For all ordinary work astringents /

astringents should be avoided as far as possible as the vaso-constriction produced is apt to simulate an infiltration very closely and thus be very misleading.

9. The Normal Appearance of the Urethra :

In appearance the normal urethra varies very considerably throughout its course, and there is also a certain degree of variation within the normal in different individuals.

(a) Glandular Portion - This section is golden yellow in colour. The wall is of tough consistence and only dilates to a slight degree under air-distension. The striations which are a typical feature of the adjacent portion of the urethra, are almost entirely absent. Situated about an inch from the meatus is a large gland, practically constant in position, - the Lacuna Magna, the free edge of the lacuna being known as the Valve of Guerin. The absence of folds in the Fossa Navicularis is due to the mucosa being firmly supported by the body of the glans.

(b) Pre-bulbar Portion - The mucosa at this part provides a striking contrast to the glandular portion. It is bright red in colour, moist, glossy and very vascular. The presence of striations is a characteristic and well-marked feature, and when examined without air-distension they are seen radiating to the periphery from the "central point" where the mucosa falls together, giving the impression of spokes /

spokes radiating from the "hub" of a wheel. The blood vessels serve to accentuate the striations. The number of folds depends to some extent on the individual and on the size of sheath used. Under air-distension the folds are largely lost.

Throughout this portion are numerous glands and lacunae. The former, the glands of Littre', are situated chiefly in the roof and are best seen under air-distension. In some cases they are almost invisible in the normal state, but usually they can be made out as a faint single or double row of points dotted along the roof. This distribution is practically constant. Occasionally there are a few scattered glands on the sides and floor of the urethra.

The Lacunae of Morgagni are also situated on the roof of the urethra in the middle line, but they rapidly diminish in number towards the bulb, in contrast to Littre's glands which are more numerous in that region. These lacunae are simply V shaped diverticulae, having their openings directed towards the meatus. In health they are not very distinct, but as one or more of Littre's glands may open into them it can be readily understood that they are very liable to become the seat of chronic infection.

Fortunately in the urethroscope the urologist possesses /

possesses an instrument which can demonstrate very definitely the presence of inflammation in either glands or lacunae.

(c) Bulb - The mucosa is deeper in colour at this part owing to increased vascularity. This fact renders it imperative to employ great care in manipulating the instrument, otherwise haemorrhage is liable to occur. The folds are more voluminous and under air pressure the compressor urethrae muscle can be seen alternately contracting and relaxing, while the floor of the urethra passes upwards and backwards out of view. The mouths of the ducts of Cowper's glands can seldom be distinguished clearly in health.

(d) Membranous Urethra - The fasciculae of the compressor urethrae muscle throw the mucous membrane into numerous regular folds. Gland structures are comparatively few in number and difficult to locate in health.

(e) Posterior Urethra - The floor is the most important part and is characterised by a projection - the verumontanum - rising from its surface. The prostatic ducts open on either side of the verumontanum. When viewed through an irrigating urethroscope the /

the mucosa appears paler than it really is, owing to the pressure exerted by the irrigating fluid. At this part the mucous membrane is very delicate and haemorrhage is easily provoked. The surface of the verumontanum is smooth and uniform in colour and as a rule the ejaculatory ducts open on it, one on either side.

This part should be specially examined for the presence of cysts or polypi.

The utriculus is a small blind depression embodied in the verumontanum and frequently seen in the centre. If the utriculus is gaping, the procedure adopted by some urologists is to inject it with some silver solution or electrargol by means of a Geraghty syringe. Should it be infected, gonococci will be demonstrable in the discharge produced.

(f) Vesical Neck - At the junction of bladder and urethra the mucosa is deep red in colour and is drawn up into deep longitudinal folds by the vesical sphincter. In colour it contrasts very strongly with the golden-yellow mucosa of the bladder.

10. Pathological Appearances :

A thorough knowledge of the naked eye appearances and of the histological structure of the normal urethra is essential for the proper appreciation of the diagnosis and treatment of the various pathological lesions met with.

(a) Acute Lesions :

In the early acute stages of gonorrhoea when it is still an anterior urethritis, the inflammation is limited to the surface of the mucosa. By the time the great majority of cases come for treatment, however, the inflammatory process has spread deeper and the submucous tissues become infiltrated with round cells.

The process spreads rapidly backwards and the bulbous urethra, where the inflammatory changes are usually most severe, is soon involved. As usually happens, the posterior urethra becomes infected and similar changes take place there.

The glands and follicles readily become infected with varying results. They may discharge infective material on the surface or the gland openings may become occluded and the organisms remain blocked up inside.

For the diagnosis of such a condition it is obviously no use relying on ordinary methods of examination. /

examination, as the patient may exhibit no clinical signs whatever of disease. The only rational course to adopt, therefore, is to examine the mucosa with the urethroscope and learn definitely whether the follicles are infected or not.

In a case of folliculitis the mouths of Littre's glands will be seen to be pouting with a red area surrounding, and frequently a tiny yellow bead of pus at the openings.

These follicles discharge their contents on the surface of the mucosa intermittently, so that the patient is constantly hovering between apparent cure and relapse. It is not uncommon to meet a patient who will give a history of several such relapses.

So far as treatment is concerned it is ~~absolutely~~ futile to rely on irrigations to cure cases of folliculitis, as the irrigating fluid never reaches the seat of the trouble. The proper treatment is to encourage the emptying of the infected glands. This can be done by means of Kollmann's irrigating dilator which, by stretching the urethra, widens the mouths of the follicles and enables the antiseptic fluid to wash out the plugs of secretion. This instrument can be suitably used at five day intervals but not oftener.

Another excellent method of treating such cases is /

is to extract the contents of the glands by suction with Mills' negative ^{pressure} catheter and suction-ball.

My own practice is to use these instruments alternately, using each instrument once weekly.

The effect of such treatment and the progress of each case can, of course, be appreciated by urethroscopic examination at suitable intervals until cure is established.

The following cases illustrate several of the points raised -

Case I :

17/2/21 History - first attack. Patient reported at clinic with acute discharge; treated with vaccines and daily irrigations; eight weeks elapsed before acute symptoms disappeared.

16/4/21 Urines - (1) Clear with threads. (2) Clear. Put on bi-weekly irrigation; three days later reported with profuse discharge. Again put on daily irrigation.

23/5/21 Urine - (1) Clear with threads. (2) Clear.

24/5/21 Urethroscoped - "Mucosa granular with definite inflammation of follicles. Some discharging pus."

Suction treatment applied on four occasions at four day intervals.

23/6/21 /

23/6/21 Urine - (1) Clear. (2) Clear.

24/6/21 Scoped - "Mucosa healthy. No evidence of folliculitis".

Discharged cured.

In this case the persistence of the acute symptoms and the relapse was due to the discharge of infected material by the follicles on to the mucosa.

Case II :

History - first attack. Incubation 7 days; duration of treatment 8 weeks.

26/7/21 Urines - (1) Clear; large numbers of muco-purulent filaments. (2) Clear.

27/7/21 Scoped - Found to be a case of severe folliculitis; the glands were inflamed and distended, one or two discharging pus.

28/7/21 Kollmann's dilator 40.

5/8/21 Suctioned.

12/8/21 Suctioned; Urines - (1) Clear with threads; (2) Clear.

26/8/21 Kollmann 40; Urines - (1) Clear; (2) Clear.

30/8/21 Suctioned; Urines - (1) Clear; (2) Clear.

21/9/21 Urethroscopic examination showed the condition to be very greatly improved. None of the follicles were discharging, and only one or two showed faint rings of hyperaemia. Still under treatment.

Case III /

Case III :

History - first attack. Incubation 18 days; discharge practically nil. Repeated examination of smears failed to detect gonococci though abundant secondary organisms were present. Patient had been treated for several months at another clinic. Complained of persistent slight mucoid discharge.

21/1/21 Scoped - Two congested follicles seen in penile urethra - one distinctly discharging pus.

Urines - (1) Clear with threads; (2) Clear.

25/1/21 Suctioned.

1/2/21 "

4/2/21 "

8/2/21 " Urines - (1) Clear; (2) Clear.

15/2/21 " Urines - (1) Clear; (2) Clear.

17/2/21 Scoped - Follicles now seen to be perfectly healthy; both urines absolutely clear.

Discharged cured.

In this case of non-gonococcal urethritis the whole trouble was traced to two follicles infected by secondary organisms.

Case IV /

Case IV :

History - Second attack. Incubation 8 days

Treated for some weeks by his own doctor
with irrigations. Complaint - persistent
mucoid discharge.

26/8/21 Urines - (1) Clear with Threads; (2) Clear.

28/8/21 Scoped - Very definite inflammation of
glands in roof.

2/9/21 Suctioned.

7/9/21 Kollmann 30.

12/9/21 Suctioned.

16/9/21 Kollmann 32; Urines - (1) Clear; (2) Clear.

21/9/21 Scoped - Follicles healthy.

Discharged cured.

Case V : The following remarkable case, though not one
of folliculitis, may suitably be mentioned here.

History - Reported with syphilitic infection
on 8/7/20. Profuse purulent discharge
from under foreskin. Syringing under
foreskin and irrigations of no avail.

27/7/20 Circumcised. Pus pouring from meatus.

No evidence of abscess in perineum or in
the pubic region. Examination per
rectum, negative. Put on vaccines. As
patient was in a precarious condition it
was decided to perform urethroscopy.

22/8/20 /

22/8/20 Urethra and bladder washed out with boric lotion.

Scoped - Mucosa congested; no pus seen coming from the follicles. Striations well defined; urethra dilates well. On withdrawing tube to Fossa Navicularis, pus seen pouring from a small sinus. Probe introduced and passed along Corpus Spongiosum to the pubic region.

This case was remarkable in that there were absolutely no symptoms or signs by which the abscess could be located. On suitable drainage the discharge cleared up. Gonococci were never discovered in any of the numerous smears taken.

(b) Sub-acute Lesions :

After a period usually varying from two to three weeks the acute process dies down and in favourable cases the round-cell infiltration of the sub-mucous tissues is removed. In others the inflammatory process progresses and the sub-mucous tissues become densely packed with round cells, the precursors of fibrous tissue. There is usually an associated folliculitis.

The folds become coarse and bulging, but in the early /

early stages can be easily distended under air-pressure showing that the infiltration is not yet sufficiently far advanced to diminish the elasticity of the mucosa. The urethra at the affected part is seen to be dull red in colour and the striations are lost. Bleeding is easily provoked owing to the increased vascularity.

If this condition of "soft infiltration" or "soft stricture" be allowed to progress without appropriate treatment, the next step is the formation of fibrous tissue. As a result the flexibility of the mucosa is diminished and the walls of the urethra as seen under air-inflation, expand and relax sluggishly. This transition stage is frequently suspected on passing the urethroscope, as the tube can be felt to be "gripped" during its introduction.

The most effective method of treatment is undoubtedly Kollmann's dilator. It stretches the urethra, the irrigating fluid softens the tissues and washes out the discharge, and the hyperaemia produced by the instrument brings about the gradual absorption of the fibrous tissue elements.

Case VI /

Case VI :

History - first attack. Incubation 4 days.

Treated with irrigations and vaccines.

Discharge almost clear when patient had an accident which prevented treatment for four weeks. On his return no evidence of discharge.

2/4/21 Urines - (1) Clear with threads; (2) Clear.

5/4/21 Scoped - Very definite soft infiltration seen in mid-penile urethra. The follicles were prominent and inflamed, but not discharging.

7/4/21 Kollmann 39.

11/4/21 Suctioned.

16/4/21 Kollmann 42. Urine - (1) Clear; (2) Clear.

23/4/21 Suctioned.

12/5/21 Scoped - No evidence of infiltration or other lesion.

Discharged cured.

Case VII /

Case VII :

History - first attack. Incubation 3 weeks;
duration 6 weeks; post urethritis; nil
in prostate.

12/10/20 Scoped - Mucosa of bulbous urethra shows
congestion and commencing soft infiltration.
Mucosa also slightly granular but follicles
not inflamed.

Urine - (1) Clear with threads; (2) Clear.

14/10/20 Kollmann (curved) 40.

23/10/20 Kollmann (") 40.

30/10/20 Kollmann (") 40.

6/11/20 Urine - (1) Clear; (2) Clear.

9/11/20 Scoped - Mucosa found to be quite healthy.

Discharged cured.

Case VIII :

History - first attack. Incubation 2 days;
intermittent discharge for 3 months.

14/7/21 Urines - (1) Clear with muco-purulent threads;
(2) Clear.

16/7/21 Scoped - Mucosa in mid-penile urethra in-
flamed and bulging; striations lost; ex-
tensive folliculitis present.

18/7/21 Kollmann 32.

20/7/21 Suctioned.

25/7/21 /

- 25/7/21 Kollmann 32.
 10/8/21 Suctioned.
 19/8/21 Suctioned.
 23/8/21 Kollmann 34.
 8/9/21 Urine - (1) Clear with few filmy threads;
 (2) Clear.
 10/9/21 Scoped - Few follicles show slight congestion; otherwise infiltration has disappeared.
 Still under treatment.

Case IX :

History - Infection 18 months previously.

Treated privately with irrigations, vaccines and prostatic massage. Complaint - persistent gleet; prostate - negative.

- 24/2/21 Urine - (1) Clear with threads; (2) Clear.
 Scoped - Very definite infiltration of transitional type seen along dorsum urethrae; tender when pressed gently; dilates sluggishly at that part. No evidence of folliculitis.
 1/3/21 Kollmann 32.
 6/3/21 Kollmann 34.
 12/3/21 Patient states gleet now absent.
 Urine - (1) Clear; (2) Clear.
 16/3/21 Kollman 34.
 26/3/21 Scoped - Everything satisfactory; no trace of infiltration.

Case X /

Case X :

History - second attack. Incubation 2 days;
duration 5 weeks. Prostate negative.

22/2/21 Urine - (1) Clear; (2) Clear.

24/2/21 Scoped - Infiltration of transitional type
seen in penile urethra; mucosa inflates
sluggishly and incompletely.

26/2/21 Straight bougies up to 10/14.

5/3/21 Kollmann 30.

10/3/21 Straight bougies up to 10/14.

18/3/21 Kollmann 34.

26/3/21 Straight bougies up to 10/14.

9/4/21 Kollmann 37.

16/4/21 Scoped - Mucosa healthy; no evidence of in-
filtration; dilates well.

Discharged cured.

(c) Chronic Lesions :

In course of time a soft infiltration becomes
converted into a hard infiltration as a result of the
development of the fibrous tissue forming elements.
As scar tissue is formed the colour of the infiltrate
changes from the deep red of the early lesion to grey,
owing to the gradual constriction of the blood vessels
by the newly formed tissue.

The /-

The resiliency of the urethra is impaired to a varying degree, depending on the extent of the invasion of the sub-mucous coat by fibrous tissue. This is well seen under air-distension. In extreme cases the lumen of the urethra remains like a funnel during withdrawal of the instrument and no folds are to be seen.

(d) Stricture is the extreme degree of hard infiltration, and the urethroscopic picture of it is unmistakable. The calibre of a stricture should always be determined by air-distension. This affords information not only with regard to the form of treatment necessary, but also with regard to the size of instrument it will be possible to start with in dilating the stricture.

The writer prefers Kidd's classification of the various types of fibrous stricture according to the extent of the lesion.

(1) The simplest type consists of a small crescent of fibrous tissue involving perhaps a quarter of the circumference of the canal. As a rule this lesion is associated with a long standing inflammation of one of Littre's glands.

(2) /

- (2) The next type is the so-called "bridle stricture", where the crescent involves about two-thirds of the canal.
- (3) The third type involves the whole circumference of the canal and is seen as a circular fibrous band. The lumen in the early stages is large, but subsequent contraction reduces it to pin-point dimensions.
- (4) The fourth type is the most difficult to treat as it arises from an extensive sub-mucous infiltration which in time produces a tunnel of fibrous tissue frequently tortuous in its course. This thickened cylinder of fibrous tissue can usually be palpated from the outside as well as seen.

The aim in the treatment of strictures should be to dilate the urethra by bougies, metal or gum-elastic as the case demands, until it is possible to introduce Kollmann's dilator. It is no exaggeration to say that this instrument is the most efficacious in the treatment of stricture, for by means of it a stricture can be over-dilated until it ceases to recur. It succeeds in effecting a permanent cure in very many cases where the old treatment by bougies fails.

Case XI :

16/9/21 History - Infection 12 months ago; duration of treatment 4 months. Complaint - difficulty in passing urine and slight gleet.

Scoped - Mucosa shows definite commencing hard infiltration about 4" from meatus; involves less than half circumference of canal. Stricture dilated by Kollmann's dilator at intervals on six occasions.

20/10/21 Scoped - Little evidence of stricture remaining; no gleet; no difficulty in passing water.

Still under treatment.

Case XII :

15/2/21 History - second attack; gonorrhoea 1919; duration 6 weeks.

Scoped - "Mucosa lustrous and of good colour except at point 2" from meatus where there is crescent-like stricture involving one-third of urethra; dilates poorly; no folliculitis".

Straight bougies were passed twice and then Kollmann's dilator used on five occasions.

19/4/21 Scoped - "Mucosa healthy; no evidence of stricture".

Discharged cured.

Case XIII /

Case XIII :

30/3/20 History - Infection 1914; treated with
irrigations; complaint - slight gleet.
Scoped - "Bridle stricture in deep part of
penile urethra. Tube cannot be passed
through it. Dilates poorly".

6/4/20 Beniqué 17 passed.

13/4/20 " 17 to 20 "

26/4/20 " 18 to 21 "

4/5/20 " 19 to 23 "

11/5/20 Kollmann 30.

26/5/20 " 32.

1/6/20 " 35.

4/6/20 Scoped - Mucosa dilates almost normally.

6/6/20 Kollmann 35.

12/6/20 " 36.

20/6/20 Scoped - "Urethra healthy and lustrous; no
evidence of stricture; dilates well
throughout".
Discharged cured.

Case XIV :

3/3/21 History - second attack; gonorrhoea three
years before; duration 4 months.
Scoped - "Scope tube stopped 4" from meatus
Small bridle-shaped stricture present;
anterior to that urethra healthy".
This /

This case was treated first with straight metal bougies and later with Kollmann's dilator.

28/6/21 Discharged cured.

Case XV :

10/2/21 History - gonorrhoea 1914; treated with irrigations. Complaint - chronic gleet and difficulty in passing water.

Urine - (1) Slight haze; (2) Slight haze.

Scoped - "Tight stricture seen at lower end of penile urethra. Dilates only slightly. Stricture completely surrounds canal".

This circular fibrous stricture was first dilated by means of gum-elastic bougies. It was then dilated further by nickel bougies of the Beniqué type. After 4 months' treatment Kollmann's dilator was used. Since then the case has progressed favourably and is now almost cured.

Case XVI :

16/5/21 History - gonorrhoea 3 years ago and 18 years ago. Treated for stricture for 15 years.

Urine - (1) Hazy; (2) Slight haze.

Hexamine and Acid Soda Phos. prescribed.

21/5/21 /

21/5/21 Scoped - "Tight circular stricture well seen at proximal end of bulbous urethra.

Urethra anterior to stricture granular and bleeds easily".

Stricture gradually dilated with gum-elastic bougies and then with Beniqué's.

26/7/21 Beniqué 21 to 23 passed.

Urine - (1) Clear; (2) Clear.

Case now being treated with Kollmann's dilator.

Case XVII :

30/9/20 History - Gonorrhoea 1919. Complaint - urine dribbling.

Urine - (1) Hazy; (2) Hazy.

Scoped - "Stricture present in fossa navicularis; also triangular-shaped stricture in mid-penile urethra. Unable to pass urethroscope beyond this".

The case was treated in hospital for a time and the strictures gradually dilated with straight bougies. On the first few occasions bleeding was profuse; dribbling continued for three months.

29/2/21 /

29/2/21 Scoped - "Two strictures seen, one mid-penile region, and one beginning of bulbous urethra. At these places mucosa is pale and dilates poorly. No bleeding but field obscured by urine. Patient states much better control over urine".

* Strictures were then dilated with Beniqué bougies at intervals.

8/9/21 Scoped - "Mucosa very greatly improved; dilates fairly well".

The urethra is now being over-dilated with Kollmann's dilator to prevent recurrence of the strictures. Perfect control over urine.

Case XVIII : The following case illustrates how strict-
ure may be simulated by spasm -

6/1/21 History - First attack; duration 6 months.
Treated privately with irrigations.

12/1/21 Scoped - "Mucosa very congested; striations not well marked; dilates well; numerous follicles discharging".

Patient was treated for this condition for about 8 weeks. He then complained of great difficulty in passing water at certain times, while at others there was no difficulty.

3/3/21 /

3/3/21 Scoped - "Urethra at entrance to bulbous portion is seen in spasm. Lumen almost obliterated. Has not the appearance of fibrous stricture though pale".

It was found impossible to pass even small gum-elastic bougies.

Patient had a good stream but the mere introduction of an instrument was always sufficient to cause spasm.

26/3/21 The bulbous urethra was anaesthetised with novocain introduced with an Ultzmann's syringe. There was then no difficulty in passing metal bougies of Beniqué type up to number 24. Bougies have been passed at intervals since and there has been no recurrence of spasm.

The following two cases are examples of tunnel strictures :

Case XIX :

4/12/20 History - Gonorrhoea 19 years before.

Treated for stricture for 12 years.

Scoped - "Urethra leathery; bleeds readily; fibrous tissue scattered irregularly throughout urethra; canal twisted and much contracted; tube only partially passed".

This /

This case required prolonged treatment with gum-elastic bougies before it was possible to pass metal instruments. On account of the twisting of the canal it is very doubtful if Kollmann's dilator will ever be passed.

Still under treatment.

Case XX :

30/7/20 History - Patient, under the impression he had gonorrhoea, washed out his urethra with a concentrated solution of permanganate. Great pain and frequency; fossa navicularis eroded and corpus spongiosum infiltrated. Destruction of tissue very marked, and patient passed great shreds of mucous membrane.

When the acute inflammation had passed off the mucosa was almost entirely replaced by scar tissue. It was found impossible to pass the smallest size of gum-elastic bougie.

Under general anaesthesia the scope tube was introduced for about $1\frac{1}{2}$ inches. The opening of the stricture was located and a fine gum-elastic bougie passed with difficulty.

Adrenalin /

Adrenalin was used to prevent haemorrhage obscuring the field. The urethroscope was used in this case to locate the opening of the stricture.

At the present time the stricture extends for fully 3 inches along the urethra and can easily be felt as a thick hard fibrous band.

It is now possible to pass gum-elastic bougies of moderate size, but owing to the manner in which the fibrous tunnel is twisted it is very unlikely that any metal instrument will ever be able to be passed. The patient suffers no inconvenience beyond some diminution of the flow of urine.

11. Rare Pathological Conditions met with :

(a) Polypi :

The mucosa of the urethra, as that in other parts of the body, is subject to the development of granulations, polypi, and other hypertrophic changes following prolonged inflammation.

Granulations occur more frequently in the posterior urethra, especially in the prostatic portion.

They are commonly pedunculated and have a poor blood supply. Histologically they consist of a delicate

fibrous stroma containing a few blood-vessels and covered with layers of thick pavement epithelium.

Papillomata are also found most commonly in the posterior urethra, and resemble granulomata in appearance.

Polypi occur at almost any part of the urethra.

They are pale and translucent and usually pedunculated.

These growths are occasionally responsible for a chronic gleet, and it is obvious that urethroscopic examination is the only possible means of diagnosing their presence.

Treatment consists in removing the growth with a curette or electro-cautery, and it is advisable to destroy the base to prevent recurrence.

Case XXI /

Case XXI :

14/6/21 History - Infection in 1916. Been troubled with gleet ever since. Slight difficulty in passing water.

Urine - (1) Slight haze; (2) Clear.

Scoped - "Large sessile polypus seen in scrotal urethra. Smaller pedunculated polypus situated $1\frac{1}{2}$ " from meatus. In other respects urethra normal".

After removal of these growths the patient had no longer any difficulty in passing water, and the gleet disappeared.

Discharged cured.

Case XXII :

26/2/21 History - Infection 1919. Treated with irrigations and vaccines. Complaint - chronic gleet.

Urine - (1) Hazy with threads; (2) Slight haze.

Scoped - "Follicles rather prominent but none discharging. Pedunculated polypus seen in deeper part urethra. Another smaller one in mid-penile region. Urethra dilates well".

The /

The polypi were removed with the curette and the base of each destroyed. The follicles were next treated, and one month from the time of reporting patient was cured.

Case XXIII :

14/7/21 History - Gonorrhoea 1917. Treated with irrigations; also silver nitrate in doubtful strength injected with a syringe. Complaint - occasional slight bleeding on urination for past 16 months. Patient was cystoscoped and nothing found.

Scoped - "On overcoming compressor urethra muscle with inflation, commencement of membranous urethra seen to be granular and looks as if it would bleed easily. No lesion of anterior urethra".

15/7/21 Posterior urethroscope (Wossidlo) used - "Mucosa of posterior urethra seen to be granular and ulcerated".

Oscol Argentum was instilled into posterior urethra on five successive days and held in for a short time.

3/8/21 Beniqué 24 passed. No bleeding. Silver solution injected on two more occasions.

28/8/21 /

28/8/21 Posterior scope - "Mucosa of posterior urethra now healthy. No trace of ulcerations"
 Urine - (1) Clear; (2) Clear.

Case XXIV :

N.L.P. Lumb, in his book on the urethroscope, describes a remarkable case which came under his care. The case was one of relapse which five months of treatment had failed to clear up. Six groups of papillomata were found at different spots, four in the penile urethra, one in the membranous portion, and one at the side of the verumontanum. The latter two were removed by means of Buerger's forceps through the cysto-urethroscope, and the others with the curette. The bases were cauterised and the after-history was uneventful.

(b) Cysts are formed from Littre's glands by the mouths becoming blocked and the walls distended with secretion. They are as a rule easily ruptured by Kollmann's dilator, failing which they should be incised.

Case XXV /



Case XXV :

26/5/21 History - First attack. Duration 8 weeks.

Scoped - "Small cyst, thin-walled; size of split-pea; seen at entrance to bulbous urethra; otherwise urethra normal".

27/5/21 The cyst was incised and then touched with iodine.

After-history uneventful.

(c) Anatomical Defects :

Valves - The exact nature of valves is uncertain. According to one theory they are derived from the circular muscular bundles of the urethra as a result of over-development; according to another they are merely reduplications of the mucosa. It has been suggested that in some cases valves are due to folds in the mucosa produced by abnormally large lacunae of Morgagni.

They vary in size and are usually found in the roof of the anterior urethra. The diagnosis of their presence depends on urethroscopy. In appearance they are U or V shaped like an incomplete diaphragm.

When treatment is necessary it consists in dividing the valve with a knife or cautery, and the flaps formed then rapidly shrivel.

Case XXVI /

Case XXVI :

12/7/21 History - Third attack. Condition cleared up under treatment.

Scoped - "Small irregular diaphragm seen at entrance to bulbous urethra. Edges and base clean. Urethra healthy.

Urine - (1) Clear; (2) Clear.

No clinical signs of disease.

Case discharged.

Diverticula - These are either congenital or acquired, and like valves occur very rarely.

The congenital type usually gives a history of urinary disturbance such as dribbling, tumour formation, or even obstruction, beginning in infancy or childhood.

Acquired diverticula are formed from various causes. In a case of stricture the urethra may dilate on the proximal side and from the resulting stagnation of urine the wall may weaken and lead to the formation of a diverticulum.

Abscesses, cysts, fistulas, or the careless manipulation of an instrument are also liable to bring about the same result. Diverticula are sometimes the cause of a persistent urethral discharge, though not necessarily gonococcal in nature.

It /

It sometimes happens, as in the two cases cited below, that there is nothing to indicate the presence of a diverticulum, the diagnosis being made during a casual urethroscopic examination.

Case XXVII :

18/8/20 History - First attack. Incubation 7 days.

Case treated with irrigations, vaccines and prostatic massage.

22/10/20 No evidence of discharge; prostate negative.

Urine - (1) Clear; (2) Clear.

Smears satisfactory.

9@11/20 Scoped - "Diverticulum seen in floor of bulbous urethra. Mucosa healthy".

In this case the diverticulum was probably congenital. No history of abscess, stricture or cyst. Patient stated he had never had instruments passed at any time. There seemed to be no indication for treatment.

Discharged cured.

Case XXVIII :

3/1/21 History - First attack. Incubation 5 days.

Patient was under treatment for 4 months.

Owing to sexual excesses the discharge was definitely purulent practically all that time.

28/4/21 /

28/4/21 When the urines had cleared up urethroscopy was performed. An acute infiltration was found in lower part of penile urethra, and a diverticulum seen just immediately beyond. The mucosa was much inflamed, also the body of the penis at that part. In this case the diverticulum was probably acquired as a result of the prolonged suppuration. Unfortunately it was not possible to follow up this case as patient left the country.

NOTE:-

In all the cases reported in this thesis in addition to urethroscopy as a test of cure, bacteriological and other methods were adopted prior to this final test. The majority of patients have since reported and been found free from all symptoms.

12. Operative Urethroscopy :

(a) Passage of Filiform Bougies :

Every now and then in the experience of most surgeons, a case of stricture comes for treatment in which all attempts to pass small size bougies by the ordinary methods meet with failure.

The difficulties in such a case are several -

- (1) There is the primary difficulty in locating the opening of the stricture.
- (2) Gum-elastic bougies of small size soon double up when any force is used.
- (3) Whale-bone bougies are firmer than gum-elastics but are very liable to cause haemorrhage.
- (4) Vain efforts on the part of the operator to locate the opening may cause damage to the urethra immediately above the stricture.

Operative urethroscopy can generally be relied upon to solve these difficulties. My own practice is to employ Cambell's urethroscope with a special eye-piece containing a small aperture through which a filiform bougie can be passed. This arrangement is not absolutely air-tight, but if the size of the aperture and the bougie approximate, a fair degree of air-distension can be maintained. By this means it is possible -

(1) /

- (1) To locate the opening of the stricture.
- (2) To distend the opening and thus facilitate the passage of a filiform.

By thus dilating a stricture and passing a filiform under control of the eye, it is frequently possible to succeed in cases where all other methods have failed.

It is advisable to employ a local anaesthetic to relieve any spasm, and adrenalin solution to limit haemorrhage.

The following cases were treated in this way -

Case XXIX :

3/11/20 History - Infection 1912. Treated with irrigations of permanganate. Complaint - gleet.

Examined recently in Dublin with urethroscope and operation advised.

Urine - (1) Hazy with threads; (2) Hazy.

Scoped - "Very tight stricture seen $3\frac{1}{2}$ " from meatus. Opening very small; dilates poorly".

Novocain and adrenalin were first injected into the urethra and then a gum-elastic bougie was passed down the urethroscope and through the stricture. The bougie was left in for 24 hours.

Subsequently /

Subsequently progressively larger sizes of bougies were passed without the aid of the urethroscope.

6/2/21 Benique 22 passed.

6/3/21 Scoped - "Stricture well seen. Greatly improved".

Patient ceased attending.

Case XXX :

24/9/20 History - Traumatic stricture through injury to pelvis in 1917. Complaint - urine dribbling.

6/10/20 Scoped - "Very contracted stricture of membranous urethra seen. It appears to be guarded by another saddle-shaped stricture further forward".

Several unsuccessful attempts made to pass gum-elastics.

10/10/20 Small gum-elastic passed successfully through urethroscope and left for 24 hours.

In the space of 3 months large size gum-elastics were able to be passed.

19/2/21 Patient ceased attending.

Case XXXI /

Case XXXI :

16/7/20 History - Infection 1916. Treated himself with sandalwood oil capsules. Complaint - pain on micturition.

30/7/20 Scoped - "Marked fibrous stricture seen in deeper part of urethra at entrance to bulb. Mucosa anterior to stricture is healthy". In this case also passage of a bougie was only possible through the urethroscope. The treatment in this case was highly successful. Beniqué bougies up to 24 were passed easily 6 months later and the stricture was then over-dilated at several sittings by Kollmann's (curved) dilator.

15/1/21 Kollmann (curved) 39.

29/1/21 Benique 26 passed.

Discharged.

(b) Electro-Cautery and Curette :

In the removal of polypi and other growths these instruments are of great value.

In the case of a pedunculated growth it is usually a simple matter to remove it with the curette, through the urethroscope. For reasons already stated Luy's instrument will be found very convenient. The growth is localised, manoeuvred into a suitable position /

position and then removed gently so as to avoid damaging healthy tissue.

Local anaesthesia is not necessary, but adrenalin solution should be at hand as, if the growth is not completely removed at the first attempt, bleeding is almost certain to be troublesome and obscure the field.

If swabs soaked in adrenalin be lightly applied to the bleeding point haemorrhage soon ceases and the operation can be completed. It is essential to cauterise the base after removal of the growth, otherwise it is very liable to recur. This can either be done with pure silver stick fused on to a probe, or with the electro-cautery at dull red heat.

For growths that are sessile in nature the electro-cautery is very satisfactory. Naturally great care and a steady hand are essentials, otherwise healthy tissue is almost certain to suffer. One advantage of the cautery is that haemorrhage is rarely troublesome.

In Case XXI already described, the pedunculated polypus was removed with the curette and in the other the electro-cautery was used.

(c) /

(c) Operative Treatment of Peri-urethral Abscess :

Occasionally it may be found necessary to relieve a peri-urethral abscess by incision. This is done through the urethroscope by means of a special knife designed for the purpose. It is rarely necessary to do this, however, as non-operative measures are generally successful.

(d) Urethrosopic Internal Urethrotomy :

The operation is very limited in this application, being only possible in cases of thin diaphragm-like stricture, situated more or less transversely across the urethra.

Technic of Operation - The patient is prepared in the usual manner and the largest urethrosopic tube possible introduced. The size is important as it is essential that the tube should not pass beyond the stricture but be pressed against it so that the fibrous band will be stretched taut across the opening. The stricture is then divided from base to free edge. Sounds should be passed to open the incision to the full diameter of the urethra.

There is always the possibility of relapse in cases treated in this manner, and the passage of bougies for a time at intervals is necessary to prevent this.

(e) /

(e) Application of Caustics to Infected Follicles:

It is the practice of many urologists to treat infected follicles by destroying them with pure silver stick fused on to a probe. This operation is carried out through the urethroscope, and in theory the probe is supposed to be passed throughout the entire length of each follicle.

In actual practice it is very doubtful if the probe ever succeeds in doing any such thing.

The mouth of a follicle, even in disease, is very small. In addition the structure of the larger glands is very intricate. They are described in Cunningham's text-book of Anatomy as being "deeply placed beneath the mucous coat, and communicating with the urethra by long slender obliquely-placed branched ducts". Some of the glands also open into the lacunae.

It is obvious therefore that no probe, however slender, can possibly convey a caustic throughout gland ducts so minute and tortuous. Even admitting the possibility of success in the case of the smaller glands with short ducts, all that happens in the great majority of cases so treated is that only the mouths of the follicles are destroyed. When the probe is applied to the opening of a follicle, and pressure applied /

applied to force it through the duct, the urethra, being a flexible tube, gives way before it, so that the probe merely cauterises the gland entrance.

If only the mouth of an infected gland is destroyed then infective material capable of liberating toxins remains pent-up in the duct.

The treatment of folliculitis therefore by cauterisation is unsound, as it possesses no certainty of success and has many disadvantages.

The best method of treatment is to aim at emptying the glands and thus free them of infection.

As already described, a very successful means of achieving this result is by the use of Mills' suction apparatus, and the results in cases so treated are eminently satisfactory.

13. Conclusions :

In the preceding pages it has been attempted to demonstrate briefly, the importance of urethroscopic examination in the diagnosis and treatment of gonorrhoea. The uses of the instrument in these connections may be conveniently summarised in the following way :

- (1) The urethroscope enables an accurate diagnosis to be made of many lesions, the presence of which in the vast majority of cases would otherwise escape undetected. Folliculitis is a case in point. Apart from gross manifestations there is only one sure method of detecting diseased follicles, and that is by looking at them through the urethroscope.
- (2) In the diagnosis of the various stages of urethral infiltration, the instrument plays an all important part. In the early stages it affords the only possible means of diagnosis, while in the later stages when contracture has taken place it is the most accurate and instructive.
- (3) For the diagnosis of stricture urethroscopic examination is essential. The passage of a bougie merely gives information of the presence of a narrowing in the canal; it fails to differentiate between stricture and spasm. By urethroscopy /

urethroscopy on the other hand it is possible to distinguish between these two conditions, and in a case of stricture gain accurate information regarding its exact site; the degree of narrowing present; the position and condition of the opening; and an idea of the size of instrument it will be possible to pass.

- (4) The diagnosis of the rarer conditions occasionally met with, such as granulations, polypi, and congenital abnormalities, depends entirely on the use of this instrument.
- (5) The greater accuracy in diagnosis rendered possible by urethroscopy, has resulted in a much higher standard of treatment, and thus reduced in a most remarkable degree the number of "relapse cases".
- (6) In conditions requiring instrumental treatment the urethroscope enables the surgeon to follow very closely the progress of each case, and exercise control over treatment in a manner which he could not otherwise do.
- (7) In lesions of the urethra necessitating operative interference, the urethroscope is absolutely essential, as it is only through it that operative measures can be carried out.
- (8) /

- (8) The frequency with which the follicles and sub-mucous tissues become infected in gonorrhoea, renders it imperative to make a urethroscopic examination in every case.
- (9) It is impossible to form an opinion of any value as regards prognosis or cure, unless such an examination has been made. The important bearing, therefore, which the instrument exercises with regard to the question of marriage is obvious.
- (10) The position held by the urethroscope in the diagnosis and treatment of gonorrhoea has been summed up shortly and clearly by Kidd. To use his own words "you can cure many of your cases "without the urethroscope, but you can only "cure all your cases if you are expert in the "use of the urethroscope". This is an opinion with which I am in entire agreement.
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In conclusion I should like to express my indebtedness to Mr David Lees, D.S.O., F.R.C.S.E., for the interest he has taken in this paper, and for permission to publish notes of cases under his charge.

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